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Book Review

Only Lewis, *Praxagoras of Cos on Arteries, Pulse and Pneuma: Fragments and Interpretation* (Leiden–Boston: Brill, 2017), pp. 375, ('Studies in Ancient Medicine', 48), ISBN: 978-90-04-33742-8/978-90-04-33743-5.

Here is a long needed and excellent work on Praxagoras of Cos, even if it is not a new 'complete' edition of his fragments. The book is the mature outcome of a doctoral fellowship in the Classics Department at Humboldt University in Berlin, as part of a research group funded by the Alexander von Humboldt-Stiftung, directed by Philip van der Eijk and entitled *Medicine of the Mind, Philosophy of the Body: Discourses of Health and Well-Being in the Ancient World*. The book focuses on a particular but fundamental part of Praxagoras' doctrines, i.e. his ideas on the arteries, the pulse and the pneuma.

After F. Steckerl's edition (*The Fragments of Praxagoras and his School*, Leiden, 1958), which offers no commentary on the context and significance of the fragments, no thorough study of Praxagoras' doctrines has been produced. This is in a way surprising, because Praxagoras has always been considered a turning point in the history of medical and philosophical thought of the fourth century BC.

The study is divided into two parts: in part 1, after a methodological introduction on collecting and editing fragments, the text and translation of the fragments are given, followed by a commentary on all the fragments and by a list of verbatim citations (pp. 1–212); part 2 is devoted to the interpretation and reconstruction of Praxagoras' anatomy and physiology of the arteries, which he identified as a distinct vascular system, together with Praxagoras' definition and physiology of the pulse and his doctrines on pneuma, its transmission and function in the body (pp. 215–309). The two parts are complementary: first the sources and a 'fragmented' analysis of their context, afterwards a broader interpretation of the fragments considered as a whole and intended to answer specific questions.

The fragments (text and English translation) are presented in a thematic order: anatomy of arteries, physiology of arteries, pneuma and soul, pathology of arteries and pneuma. This choice means that the editor has a pragmatic perspective and consequently no ambition to identify the original context in which Praxagoras' ideas were stated: in fact only in two fragments (2b, 21) is there an indication of the works in which they originally appeared.

Lewis also includes some 'hidden fragments' – i.e. passages where the name of Praxagoras is not cited – which were not in Steckerl's edition (frgs. 29–32). They all concern the pathology of arteries and pneuma and are taken from the Anonymous Parisinus, *On Acute and Chronic Diseases*, a text which lists the causes and symptoms of many diseases, starting with a doxographical section that is based exclusively on the four 'ancient' (as the author says) physicians Hippocrates, Diocles of Carystus, Praxagoras of Cos and Erasistratus. When the author believes that they had a common opinion, he refers to them by terms such as 'the ancients' or 'the four'. One can therefore infer that the described opinion was shared by Praxagoras.

The lemmatic commentary of the fragments is consistently preceded by two useful preliminary sections: the first, 'Contents', singles out the essence of the fragment, the

second, 'Context', is particularly important because it informs the reader about the source from which the fragment is taken and explains the whole discussion of the source-author, the possible manipulation or misinterpretation of Praxagoras' thought and the role that the 'fragment' in question plays in it, thus making it easier for the reader to access the detailed commentary that follows. The inspiring model is Philip van der Eijk's edition of Diocles of Carystus' fragments (vol. 2, Brill, 2001).

The second part of the book consists of two chapters: 1) Praxagoras on arteries and pulse (pp. 215–251); 2) Praxagoras on pneuma (pp. 252–298). After a short introduction on the ancient debate about the vessels in the human body, the fundamental question is: 'What are the arteries?' Through a close analysis of the relevant sources, Lewis outlines the distinctive properties of arteries according to Praxagoras. He was the first to develop a clear conception of two distinct types of vessels – arteries and veins. The arteries stem from the left side of the heart through the 'thick artery' and have three distinctive properties: a sinew-like appearance (particularly in their extremities, where they are no longer hollow), a constant natural motion (pulsation) and naturally containing only pneuma. The last two properties prompted Praxagoras to make a physiological distinction by reference to function, because for him the arteries and their pulsation guarantee the supply of pneuma throughout the body. First, Lewis refutes the common opinion that Praxagoras held that arteries actually *become neura* (sinews) in their extremities, insisting that Praxagoras, like Aristotle, focuses on the arteries' *appearance*.

But more interesting (and new) is Lewis' attempt at explaining the possible origins of Praxagoras' ideas. In the face of a critical common view according to which Praxagoras arrived at his doctrine purely on the basis of a 'theoretical demand' (i.e. to separate the streams of pneuma and blood), this chapter argues plausibly that observation of a different appearance and motion of the vessels led him to the conclusion that there are two types of vessel, and this in its turn led him to seek the reason for the difference he perceived. So, empirical evidence and a teleological frame of mind (and perhaps an analogy with the respiratory motion of lungs and heart) have contributed to the formation of Praxagoras' solution. Lewis focuses very properly on the similarities with Aristotle's description of the distinctive morphology of the aorta and its branches and of the pulse as a natural phenomenon, which may have been part of Praxagoras' anatomical and physiological epistemology.

An extensive debate with Steckerl's opinions (and those of other scholars, such as Solmsen) runs through the following chapter: Lewis refutes the idea that Praxagoras thought that the origin of arterial pneuma was not only the heart but also provided by the perspiration of the body, and she subsequently claims that for Praxagoras the only source of pneuma is air inhaled through respiration (possibly perspiration as a secondary source), rendered dense and moist by encountering the flesh of the body, *not* air as a byproduct of digestion.

In the last section (4) of the chapter, Lewis argues vigorously that Praxagoras considered the neura-like extremities of the arteries the final conductors of pneuma (even if they are not hollow) and transmitted the motor function to the different parts; she also argues that the pneuma is only the transmitter of sensory activities, which are directed by the heart. Finally, she refutes Steckerl's opinion that for Praxagoras the soul is pneuma, through a strict interpretation of the rhetoric in Galen's text of frg. 16 (*Usu resp.*), and she even casts doubt on whether Praxagoras actually asked himself questions such as 'what is the soul?'.

Lewis' method is always sound in offering a thorough and precise reinterpretation of all the ancient sources and in positioning Praxagoras' arguments against the background of

the epistemological framework of his time: the very last pages of the book offer a precious synthesis just of the cultural context (‘Praxagoras in Context: the Place of his Doctrines in the History of Greco-Roman Medicine and Philosophy’, pp. 303–309). Lewis’ will be the reference book on Praxagoras from now on.

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